

Appl. No 10/587,850 Amdt. dated April, 13 2010

Reply to Office Action March, 19 2010

Claims

1 (Canceled)

2 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
said ~~polarization layers~~ P_i being cartesian polarizers, and the normal vectors of
said ~~polarization layers~~ P_i being ~~arranged in planes which are perpendicular~~
~~to a common ground plane, and all said optical axes being coplanar to a~~
~~common ground plane~~ coplanar.

3 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 2,
said ~~polarizing layer vector~~ V_1 of P_1 and said ~~polarizing layer vector~~ V_2 of P_2
being perpendicular to V_2 ~~each other~~.

4 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 3,
said polarizing layers P_2 and P_3 ~~forming~~ being part of a common polarization
polarizing beam splitting layer with a common layer vector.

5 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, comprising
at least one composed prism with a right triangular prism composed of base
comprising two right sub-prisms T_1 and T_2 each with an isosceles triangular
base;
the lateral surface of sub-prism T_2 ~~in-between the two sub-prisms~~ facing T_1 carrying
a cartesian polarization layer P_1 ;
the lateral surface of sub-prism T_1 , which together with a lateral surface of sub-

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prism T2 forms a common lateral surface of said composed prism, carrying a cartesian polarization layer P2.

6 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, comprising
a right prism with an isosceles triangular base;
the two lateral surfaces of equal size of said prism carrying mutually
complementary each a polarization[[s]] layer[[s]].

7 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
comprising an additional fourth-polarization polarizing beam splitting layer P4
which together with said P2 and ~~with said~~ P3 constitutes an additional
complex polarizer system cross-polarizer according to claim ~~30~~ 31.

8 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 7,
~~polarization layers P1 and P4 having parallel polarizing layer vectors and being~~
coplanar and having a common layer vector, and the polarization layers P2
and P3 ~~having parallel polarizing layer vectors and being coplanar and~~
having a common layer vector, ~~and all four layers having an intersection line.~~

9 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising
at least two polarizing layers P_i ($i=1,2,\dots$);
said P_i characterized by a normal vector N_i normal to P_i and a polarizing layer
vector V_i coplanar to P_i ;
said P_i having beam splitting properties, which split an incident beam into a

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transmitting and a reflected beam;
said V_i and the reflected beam spanning the plane of polarization of the reflected beam;
said V_i and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;
P1 and a further polarizer being arranged along a first optical path S1 such that the plane E1 is spanned by V_1 and the optical axis of S1 in P1, and the plane E2 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S1 in said further polarizer;
said two polarizing layers being mutual complementary, characterized by the plane $E1^*$, derived from E1 by optional means for folding, being perpendicular to E2;
P1 and a further polarizer being arranged along a second optical path S2 such that the plane E3 is spanned by V_1 and the optical axis of S2 in P1, and a plane E4 is spanned by the polarizing layer vector of said further polarizer and the optical axis of S2 in said further polarizer;
said two polarizing layers being mutual complementary, characterized by the plane $E3^*$, derived from E3 by optional means for folding, being perpendicular to E4;
said two optical paths S1 and S2 intersecting in P1 with equal cutting angles between N1 and S1 and between N1 and S2;
the architecture of the system coupling the transmission at P1 to a reflection at the further polarizer along S1 and the corresponding reflection at P1 to a transmission at the further polarizer along S2.

10 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) comprising
at least three polarizing layers P_i ($i=1,2,3,\dots$);

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said P_i characterized by a normal vector N_i normal to P_i and a polarizing layer vector V_i coplanar to P_i ;
said P_i having beam splitting properties, which split an incident beam into a transmitting and a reflected beam;
said V_i and the reflected beam spanning the plane of polarization of the reflected beam;
said V_i and the transmitting beam spanning a plane perpendicular to the plane of polarization of the transmitting beam;
 P_1 and P_2 being arranged along a first optical path S_1 such that the plane E_1 is spanned by V_1 and the optical axis of S_1 in P_1 , and the plane E_2 is spanned by V_2 and the optical axis of S_1 in P_2 ;
said polarizing layers P_1 and P_2 being mutual complementary, characterized by the plane E_1^* , derived from E_1 by optional means for folding, being perpendicular to E_2 ;
 P_1 and P_3 being arranged along a second optical path S_2 such that the plane E_3 is spanned by V_1 and the optical axis of S_2 in P_1 , and a plane E_4 is spanned by V_3 and the optical axis of S_2 in P_3 ;
said polarizing layers P_1 and P_3 being mutual complementary, characterized by the plane E_3^* , derived from E_3 by optional means for folding, being perpendicular to E_4 ;
said two optical paths S_1 and S_2 intersecting in P_1 with equal cutting angles between N_1 and S_1 and between N_1 and S_2 ;
the architecture of the system coupling the transmission at P_1 along S_1 to a reflection at P_2 and the corresponding reflection at P_1 to a transmission at P_3 along S_2 .

11 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 10,

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comprising an additional fourth polarizing layer P4, which together with said P2 along a third optical path S3 and together with said P3 along a fourth optical path S4 constitutes an additional cross-polarizer according to claim 10.

12 (Canceled)

13 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being cartesian polarizers, ~~e.g. wire-grid polarizers~~.

14 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being thin-film polarizers of the MacNeille type.

15 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31,
all of said Pi being contained in a body and the optical paths into and out of the ~~cross-polarizing system being made possible by~~ with windows or openings.

16 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31, further comprising
at least two spatial light modulators;
said complex polarizer system being used to feed the spatial light modulators with polarized light.

17 (Currently amended): Complex polarizer system for reciprocal polarization ~~{cross-polarizer}~~ according to claim ~~30~~ 31, further comprising
at least two spatial light modulators;

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said complex polarizer system being used to superpose the modulated light from the spatial light modulators.

- 18 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31, further comprising at least two spatial light modulators of the type micro-electro-mechanical-system (MEMS, e.g. ~~DMD by Texas Instruments~~);
said complex polarizer system being used to feed the spatial light modulators with polarized light and to superpose the modulated light from the spatial light modulators.
- 19 (Withdrawn): Complex polarizer system for reciprocal polarization (cross-polarizer) according to claim 9, further comprising at least one spatial light modulator positioned in said optical paths S1 and S2 between P1 and P2.
- 20 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim 15, further comprising at least one spatial light modulator which is mounted to the body.
- 21 (Currently amended): Complex polarizer system ~~for reciprocal polarization (cross-polarizer)~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms with the base of an isosceles triangle each, with a thin-film type polarizing layer P1 ~~with its layer vector V1~~ being situated between these two sub-prisms;
the lateral surface of the compound prism which consists of two lateral surfaces of the sub-prisms carrying a cartesian type polarizing layer P2 ~~with its layer vector V2~~;

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V2 being perpendicular to V1.

22 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms
with the base of an isosceles triangle each, with a cartesian type polarizing
layer P1 ~~with its layer vector V1~~ being situated between these two sub-prisms;
the lateral surface of the compound prism which consists of two lateral surfaces of
the sub-prisms carrying a cartesian type polarizing layer P2 ~~with its layer~~
~~vector V2~~.

23 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being a compound prism composed of two right triangular sub-prisms
T1a, T1b with the base of an isosceles triangle each;
those lateral surfaces of the compound prism ~~[[,]]~~ which consist of only one lateral
surface of the sub-prisms carrying ~~polarization layers~~ P1 and P2.

24 (Currently amended): Complex polarizer system ~~for reciprocal polarization~~
~~{cross-polarizer}~~ according to claim ~~30~~ 31,
comprising at least one right triangular prism;
said prism being composed of two right sub-prisms with the base of an isosceles
triangle each;
a thin-film type polarizing layer P1 being situated between these two sub-prisms.

25 (Canceled)

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26 (Currently amended): Method of using a complex polarizer system according to claim ~~30~~ 31.

27 (Canceled)

28 (Canceled)

29 (Canceled)

30 (Canceled)

31 (New) Complex polarizer system,

comprising an arrangement of three polarizing beam splitting layers P_i , wherein $P_i = P_1, P_2, P_3$;

each P_i being characterized by its layer vector V_i , wherein $V_i = V_1, V_2, V_3$,
whereas V_i is defined to be coplanar to P_i and is defined such that a linearly polarized light beam propagating towards P_i is reflected at P_i if its plane of polarization is equal to the plane spanned by V_i and the propagation axis of said beam;

said polarizing beam splitting layer P_1 being configured to split an unpolarized light beam propagating along axis A_1 into a linearly polarized light beam transmitting P_1 , and a linearly polarized light beam which is reflected by P_1 into the axis A_2 ;

said polarizing beam splitting layer P_2 being arranged along A_1 such that A_1 and V_2 span a plane which is normal to the plane spanned by A_1 and V_1 ;

P_2 and P_1 therefore being configured as a polarizing beam splitting system

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wherein a linearly polarized beam which transmits P1 along A1 is reflected at P2;

said polarizing beam splitting layer P3 being arranged along A2 such that

A2 and V3 span a plane which is normal to the plane spanned by A2 and V1;
P3 and P1 therefore being configured as a polarizing beam splitting system

wherein a linearly polarized beam which is reflected at P1 into A2 transmits P3.

32 (New): Complex polarizer system according to claim 31,
comprising at least one right triangular prism;
at least one lateral surface of said prism carrying a polarizing beam splitting layer
Pi.

33 (New): Complex polarizer system according to claim 32,
two lateral surfaces of said prism carrying polarizing beam splitting layers.

34 (New): Complex polarizer system according to claim 8,
P1 and P4 being polarizing beam splitting layers of the thin-film type;
P2 and P3 being polarizing beam splitting layers of the cartesian type.

35 (New): Complex polarizer system according to claim 31,
all of said Pi being wire grid polarizers.

Hopfstadt, April 14th
J. W. J.

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